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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,724	09/28/2001	Jean-Marie Aubry	2001-1443A	7009

513 7590 11/20/2002

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WASHINGTON, DC 20006-1021

EXAMINER

PRICE, ELVIS O

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 11/20/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/937,724

Applicant(s)

AUBRY ET AL.

Examiner

Elvis O. Price

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. Claims 1-11 are pending in the application.
2. The amendment, filed 10/28/02, has overcome the claim objection of claim 4 issued in the office action dated 7/30/02.
3. Applicants' arguments, filed 10/28/02, were found convincing to overcome the 35 USC 102(b) rejection issued in the office action dated 7/30/02. However, a new rejection for all claims was issued (see below).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al. {J. Chem. Soc., Perkin Transactions 1, 1975, pp. 1610-1614}, in view of Van Laar et al. {Chem. Commun., pp. 267-268}.

Applicants claim a process for the oxidation of hydrophobic organic substrates, by means of singlet oxygen, which comprises adding between 30% to 70% hydrogen peroxide to the said substrates in an organic solvent in the presence of a homogeneous catalyst.

Barton et al. teach a process for the oxidation of a hydrophobic organic substrate which comprises adding a homogeneous molybdate (ammonium or sodium molybdate)-hydrogen peroxide catalyst (30% peroxide was used to make the catalyst) to the

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substrate(s) in the presence of an organic solvent such as tertiary butanol (see pg. 1612, second column, experimental section). The difference between the presently claimed invention and what is taught by the Barton et al. reference is that Barton et al. do not explicitly teach that the oxidative reaction takes place by means of singlet oxygen and Barton et al. are silent about the reaction temperature.

Van Laar et al. teach that singlet oxygen can be generated from alkaline hydrogen peroxide in the presence of homogeneous metal ion catalyst such as molybdate (see first paragraph of page 267).

Thus, it would have been *prima facie* obvious to one having ordinary skill in the art to arrive at the presently claimed invention, because Barton et al. teach an oxidation process which comprises adding 30% hydrogen peroxide to hydrophobic organic substrates in an organic solvent in the presence of a homogeneous catalyst (ammonium molybdate or sodium molybdate) and Van Laar et al. teach that singlet oxygen is generated as a reactive species, from alkaline hydrogen peroxide in the presence of homogeneous metal ion catalyst such as molybdate. Additionally, one of ordinary skill in the art would have expected that the reaction temperature of the Barton et al. oxidation process was room temperature since Barton et al. were silent about the reaction temperature.

The skill artisan would have been motivated to oxidize organic substrates as presently claimed, in view of the teachings of the Barton et al. and Van Laar et al. references, using the molybdate-hydrogen peroxide homogeneous catalyst taught by

Barton et al., so as to arrive at alternative means, depending on cost and availability of the said catalyst system, for oxidizing hydrophobic organic substrates.

Response to Arguments

Applicant's arguments filed 10/28/02 have been fully considered but they are not persuasive.

Applicant argues that the molybdate catalyzed conversion of compound V into compound VI with H₂O₂, according to Barton et al., does not proceed via singlet oxygen. Applicant contends that under the conditions employed by Barton et al. molybdate reacts to form a tetraperoxo species, and that tetraperoxo species is and inefficient generator of singlet oxygen. To support such an argument applicant points to the fact that the cerium oxide converts compound V (the reaction shown, by Barton et al., to proceed via singlet oxygen oxidation) into a different product than that of the molybdate catalyst in the Barton et al. reference.

This argument is not convincing to the Examiner because Barton et al. has not implied or suggested that the use of the molybdate does not proceed via singlet oxygen. It appears that the cerium oxide-hydrogen peroxide catalyst, used by Barton et al. to carry out oxidation of phenols, is a preferred catalyst system for the generation of singlet oxygen (see last paragraph of col. 2 on pg. 1611). This in no way implies that the molybdate-hydrogen peroxide catalyst does not generate singlet oxygen. In fact, the molybdate ion, coupled with alkaline H₂O₂, is known in the art as a catalyst system that can generate singlet oxygen (see the middle of the first paragraph of page 267 in Van Laar et al. Chem. Commun., pp. 267-268). Applicant's comparison of the cerium

oxide-hydrogen peroxide catalyst versus the molybdate-hydrogen peroxide catalyst in the conversion of compound V to compound VII versus compound VI, respectively, is not a true side by side comparison considering that the reaction conditions are quite different (see the experimental section of the Barton et al. reference for the conversion of compound V to compound VI or compound VII using molybdate-hydrogen peroxide or cerium oxide-hydrogen peroxide, respectively). Since Barton et al. have disclosed a method as to how to ascertain whether or not singlet oxygen is generated as a reactive species in oxidative reactions, where metal ion-hydrogen peroxide serves as the catalyst system, the Examiner would suggest--if applicant intends to demonstrate that the molybdate-hydrogen peroxide system, taught by Barton et al., does not generate singlet oxygen--that applicant substitute substrates such as ergosterol, lumisterol and/or alpha-terpinene for compound V and carry out the oxidation reaction using the said molybdate-hydrogen peroxide system taught by Barton et al. so as to determine whether the corresponding peroxides as products are formed or not.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elvis O. Price whose telephone number is 703 605-1204. The examiner can normally be reached on 8:30 am to 5:00 pm; Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 703 308-4532. The fax phone numbers for the organization where this application or proceeding is assigned is 703 308-4556 for regular communications.

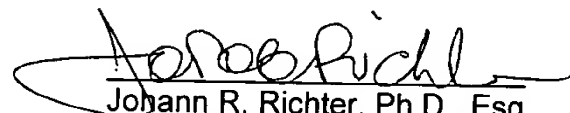
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-1235.

Elvis O. Price, Ph.D.

November 18, 2002


Johann R. Richter, Ph.D., Esq.
Supervisory Patent Examiner
Technology Center 1600